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10/535,182	05/17/2005	Hideki Matsumura	KIM-001	2369

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EXAMINER	
TAYLOR, EARL N	
ART UNIT	PAPER NUMBER
2818	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/535,182	MATSUMURA ET AL.	
	Examiner	Art Unit	
	EARL N. TAYLOR	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *7 and 9-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 May 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/17/2005 and 9/17/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group II, claims 1-6 and 8 in the reply filed on 7 October 2008 is acknowledged. Accordingly claims 1-6 and 8 are being examined on the merits. Claims 7 and 9-13 are withdrawn from consideration.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The IDS submitted on 17 May 2005 cites reference JP 2001-322680 A, however, the applicant has not provided the reference thus the reference has not been considered. It is also noted that the applicant has provided Japanese and Chinese search reports on 17 September 2007, a total of six documents which are not cited on the IDS dated on 17 September 2007 thus have not been considered. All other references cited on the IDS(s) dated 17 May 2005 and 17 September 2008 have been considered.

Specification

The disclosure is objected to because of the following informalities:

Page 28, line 6, recites "formed on formed on" and should read --formed on--.

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

Figures 35(a), 36(a) and 38 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 1-6 and 8 are objected to because of the following informalities:

Claims 1-3 recite "at a second direction array pitch py obtained ..." and should read --at a second direction array pitch py/n obtained ...--.

Claim 2 recites in the second to last paragraph "... an array pitch px ..." and should read --the array pitch px--. Claim 2 also recites in the second to last paragraph"... an array pitch py ..." and should read --... the array pitch py ...--

Claims 4-6 recites "A method for selectively transferring onto a planar display substrate each controlling a plurality of pixels with a integrated circuit ..." and should read --The method for selectively transferring onto the planar display substrate each controlling the plurality of pixels with the integrated circuits ...--.

Claim 8 recites "... for controlling a plurality of pixels ..." and should read --... for controlling the plurality of pixels ...--. Claim 8 also recites "... and forming wirings on a planar display substrate ..." and should read --... and forming wirings on the planar display substrate ...--.

These are examiner suggested ways to correct the language but are not limited. The applicant should make sure that the claim language is grammatically correct and to avoid antecedent basis issues.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 beginning at line 3, regarding the step of "fixing", recites "a substrate for pixel control devices", which is unclear as to the actual presence of pixel control devices on a substrate at this step. The language "for" does not necessarily limit the substrate to actually comprise pixel control devices. Regarding the limitation, "each of which controls a plurality of pixels" at lines 4-5; is unclear that the plurality of pixels are present at this step. It appears from the applicant's specification that the pixels aren't formed until after the control devices are transferred to the planar display substrate. The scope of elements required during the step of "fixing onto a support substrate" is unclear. The same remarks are applied for the same claim language in Claims 2 and 3.

Claim 1 beginning at line 6, regarding the step of "fixing", it is unclear if the pixel control devices are previously required and if so are they removed from the "substrate for pixel control devices" and fixed onto "a substrate for pickup" or is "the substrate for pixel control devices" (with or without pixel control devices?) fixed to "the substrate for pickup"? The step further states "that has been cut every one integrated circuit" which is unclear as to if the pixel control devices are previously required if so does the scope of the claim require a step of cutting or not? The language "that has been cut every one integrated circuit" does not appear to be grammatically correct. The scope of elements required during the step of "fixing onto a substrate for pickup" is unclear. The same remarks are applied for the same claim language in Claims 2 and 3.

Claim 1 beginning at line 8, regarding the step of "causing", it is unclear as to what actual step is required because the term "causing" is an outcome but does not positively recite a step; further it is unclear if the pixel control devices are previously

required on "the substrate for pickup". Also the tense of the verbs to describe a step are inconsistent "causing", "chucked", "retained" and "transferring" for example. The same remarks are applied for the same claim language in Claims 2 and 3.

Regarding Claims 1-6 and 8, it is unclear as to where the pixels are formed if they are formed, as the claims do not positively recite forming them.

Claim 4 recites "... and transferred to a center of the pixels arrayed in 2 columns and 6 rows"; it is unclear if the pixels were ever formed, if so when they were formed and where were they formed.

Claim 5 recites "that has been cut" and then recites "is cut ... after"; it is unclear when the pixel control devices are cut every one integrated circuit. Claim 5 also does not describe the relative orientation of what constitutes upside down versus downside up of the substrate for pixel control devices. Claim 5 also recites "... substrate for pixel control devices is cut every one integrated circuit after the surface of the substrate for pickup is directed upward"; the limitation "after the surface of the substrate for pickup is directed upward" lacks antecedent basis as the claim does not previously or positively recite rotating or flipping the substrate.

Claim 6 recites "... with the substrate for pixel control devices upside down, after the substrate for pixel control devices is cut every one integrated circuit ..."; the limitation "after the substrate for pixel control devices is cut every one integrated circuit" lacks antecedent basis as the claim does not previously or positively recite cutting the pixel control devices every one integrated circuit.

Claim 8 recites "... and forming wirings on a planar display substrate by screen printing using a screen mask that has a predetermined pattern corresponding to the wirings formed on the planar display substrate ..."; this appears to be circular logic in that forming the wirings require the screen mask to have a predetermined pattern corresponding to the wirings already formed. In other words the step of forming the wirings requires the wirings to already be formed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwafuchi et al. (U.S. Patent Application Publication 2002/0096994 A1) hereinafter referred to as "Iwafuchi" in view of Natori et al. (JP 2002-244576 A) as cited on applicant submitted IDS dated 17 May 2005.

As insofar as Claim 1 is definite, Iwafuchi teaches, in Fig. 26-28 for example, a method for selectively transferring pixel control devices (thin film transistors; TFTs) onto a planar display substrate (second substrate; Fig. 13-15) comprising the steps of:

providing pixel control devices (TFTs; Fig. 26) each having a surface thereof

provided with a plurality of integrated circuits on a first substrate (substrate for pixel control devices; 163);

fixing the first substrate (substrate for pixel control devices; 163) comprising the pixel control devices (TFTs; 164) onto a support substrate (161);

cutting the pixel control devices (TFTs; 164) every one integrated circuit (into separate devices) (Fig. 26; par. 220);

wherein the plurality of pixel control devices (TFTs; 164) are formed on the first substrate (substrate for pixel control devices; 163) at a first direction array pitch px/m that is obtained by dividing an array pitch px in a first direction on the planar display substrate (second substrate) by a natural number m and at a second direction array pitch py/n obtained by dividing an array pitch py in a second direction on the planar display substrate (second substrate) that is orthogonal to the first direction by a natural number n (Fig. 13-15; par. 138, 149, 150 for example), but does not explicitly show for this specific embodiment the step of:

fixing the pixel control devices (TFTs) that has been cut into individual devices of the first substrate (substrate for pixel control devices; 163) onto a pickup substrate; and

chucking and retaining a number of pixel control devices (TFTs) that are on the pickup substrate onto a pickup device only corresponding to the array pitches px and py of the planar display substrate and transferring the pixel control devices (TFTs) from the pickup substrate to the planar display substrate.

However, Iwafuchi teaches that the devices that are transferred can be thin film transistors (TFTs; par. 29, 136, 151; Fig. 13-15). Though light emitting diodes are

shown in some of the embodiments, Fig. 35-45 for example, Iwafuchi teaches that they can be transistors (par. 254). Further evidence is with regard to picking up the thin film transistor of Fig. 29 by an attracting mechanism the same way as described with reference to Fig. 22 for example (par. 226 and 229). The actual device being transferred in the method can be either light emitting diodes or thin film transistors.

Iwafuchi teaches in Fig. 40, the devices (though using LEDs) having a first substrate (which for the TFTs is 163) fixed on a support substrate (270); fixing the devices on a pickup substrate (280); then chucking and retaining a number of the devices that are on the pickup substrate (280) onto a pickup device (282) only corresponding to the array pitches px and py of the planar display substrate (second substrate in Fig. 13-15; 292 in Fig. 44) and transferring the devices from the pickup substrate (280) to the planar display substrate (second substrate in Fig. 13-15; 292 in Fig. 44).

As further evidence, Natori teaches that it is known to pickup and transfer pixel control devices (TFTs) with a vacuum chuck (Fig. 8).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to fix the pixel control devices (TFTs) taught by Iwafuchi to a pickup substrate and then selectively pickup and re-array the pixel control devices from the pickup substrate to a display substrate using a chuck as taught by the prior art, specifically Natori, and knowledge disclosed by Iwafuchi in order to provide an image display unit capable of enhancing characteristics such as resolution, image quality, and luminous efficiency, facilitating formation of a large-sized screen, and reducing the

production time and costs. And to provide a method of arraying devices, which is capable of transferring micro-devices to a wider region without degrading positional accuracy after transfer and without the occurrence of a wiring failure.

Specific relevant portions for location of terms in the Iwafuchi reference are as follows:

(par. 5, 155) – liquid crystal display units

(par. 29,136, 151, 222-228) – thin film transistors

As insofar as Claim 2 is definite, Iwafuchi teaches, in Fig. 26-28 for example, a method for selectively transferring pixel control devices (thin film transistors; TFTs) onto a planar display substrate (second substrate; Fig. 13-15) comprising the steps of:

providing pixel control devices (TFTs; Fig. 26) each having a surface thereof provided with a plurality of integrated circuits on a first substrate (substrate for pixel control devices; 163);

fixing the first substrate (substrate for pixel control devices; 163) comprising the pixel control devices (TFTs; 164) onto a support substrate (161);

cutting the pixel control devices (TFTs; 164) every one integrated circuit (into separate devices) (Fig. 26; par. 220);

wherein the plurality of pixel control devices (TFTs; 164) are formed on the first substrate (substrate for pixel control devices; 163) at a first direction array pitch px/m that is obtained by dividing an array pitch px in a first direction on the planar display substrate (second substrate) by a natural number m and at a second direction array

pitch py/n obtained by dividing an array pitch py in a second direction on the planar display substrate (second substrate) that is orthogonal to the first direction by a natural number n (Fig. 13-15; par.), but does not explicitly show for this specific embodiment the step of:

fixing the pixel control devices (TFTs) that has been cut into individual devices of the first substrate (substrate for pixel control devices; 163) onto a pickup substrate; and

chucking and retaining a number of pixel control devices (TFTs) that are on the pickup substrate onto a pickup device only corresponding to the array pitches px and py of the planar display substrate and transferring the pixel control devices (TFTs) from the pickup substrate to the planar display substrate.

However, Iwafuchi teaches that the devices that are transferred can be thin film transistors (TFTs; par. 29, 136, 151; Fig. 13-15). Though light emitting diodes are shown in some of the embodiments, Fig. 35-45 for example, Iwafuchi teaches that they can be transistors (par. 254). Further evidence is with regard to picking up the thin film transistor of Fig. 29 by an attracting mechanism the same way as described with reference to Fig. 22 for example (par. 226 and 229). The actual device being transferred in the method can be either light emitting diodes or thin film transistors for example.

Iwafuchi teaches in Fig. 40 for example, the devices (though using LEDs) having a first substrate (which for the TFTs is 163) fixed on a support substrate (270); fixing the devices on a pickup substrate (280); then chucking and retaining a number of the devices that are on the pickup substrate (280) onto a pickup device (282) only

corresponding to the array pitches px and py of the planar display substrate (second substrate in Fig. 13-15; 292 in Fig. 44); wherein the pickup device (282) has vacuum chuckholes formed therein at an array pitch px in a direction corresponding to the first direction and an array pitch py in a direction corresponding to the second direction for chucking the devices(par. 265); and transferring the devices from the pickup substrate (280) to the planar display substrate (second substrate in Fig. 13-15; 292 in Fig. 44).

As further evidence, Natori teaches that it is known to pickup and transfer pixel control devices (TFTs) with a vacuum chuck (Fig. 8).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to fix the pixel control devices (TFTs) taught by Iwafuchi to a pickup substrate and then selectively pickup and re-array the pixel control devices from the pickup substrate to a display substrate using a chuck as taught by the prior art, specifically Natori, and knowledge disclosed by Iwafuchi in order to provide an image display unit capable of enhancing characteristics such as resolution, image quality, and luminous efficiency, facilitating formation of a large-sized screen, and reducing the production time and costs. And to provide a method of arraying devices, which is capable of transferring micro-devices to a wider region without degrading positional accuracy after transfer and without the occurrence of a wiring failure.

As insofar as Claim 3 is definite, Iwafuchi teaches, in Fig. 26-28 for example, a method for selectively transferring pixel control devices (thin film transistors; TFTs) onto a planar display substrate (second substrate; Fig. 13-15) comprising the steps of:

providing pixel control devices (TFTs; Fig. 26) each having a surface thereof provided with a plurality of integrated circuits on a first substrate (substrate for pixel control devices; 163);

fixing the first substrate (substrate for pixel control devices; 163) comprising the pixel control devices (TFTs; 164) onto a support substrate (161);

cutting the pixel control devices (TFTs; 164) every one integrated circuit (into separate devices) (Fig. 26; par. 220);

wherein the plurality of pixel control devices (TFTs; 164) are formed on the first substrate (substrate for pixel control devices; 163) at a first direction array pitch px/m that is obtained by dividing an array pitch px in a first direction on the planar display substrate (second substrate) by a natural number m and at a second direction array pitch py/n obtained by dividing an array pitch py in a second direction on the planar display substrate (second substrate) that is orthogonal to the first direction by a natural number n (Fig. 13-15; par.), but does not explicitly show for this specific embodiment the step of:

fixing the pixel control devices (TFTs) that has been cut into individual devices of the first substrate (substrate for pixel control devices; 163) onto a pickup substrate; and

chucking and retaining a number of pixel control devices (TFTs) that are on the pickup substrate onto a pickup device only corresponding to the array pitches px and py of the planar display substrate and transferring the pixel control devices (TFTs) from the pickup substrate to the planar display substrate.

However, Iwafuchi teaches that the devices that are transferred can be thin film transistors (TFTs; par. 29, 136, 151; Fig. 13-15). Though light emitting diodes are shown in some of the embodiments, Fig. 35-45 for example, Iwafuchi teaches that they can be transistors (par. 254). Further evidence is with regard to picking up the thin film transistor of Fig. 29 by an attracting mechanism the same way as described with reference to Fig. 22 for example (par. 226 and 229). The actual device being transferred in the method can be either light emitting diodes or thin film transistors.

Iwafuchi teaches in Fig. 40, the devices (though using LEDs) having a first substrate (which for the TFTs is 163) fixed on a support substrate (270); fixing the devices on a pickup substrate (280); then chucking and retaining a number of the devices that are on the pickup substrate (280) onto a pickup device (282) only corresponding to the array pitches px and py of the planar display substrate (second substrate in Fig. 13-15; 292 in Fig. 44) and transferring the devices from the pickup substrate (280) to the planar display substrate (second substrate in Fig. 13-15; 292 in Fig. 44).

As further evidence, Natori teaches that it is known to pickup and transfer pixel control devices (TFTs) with a vacuum chuck (Fig. 8).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to fix the pixel control devices (TFTs) taught by Iwafuchi to a pickup substrate and then selectively pickup and re-array the pixel control devices from the pickup substrate to a display substrate using a chuck as taught by the prior art, specifically Natori, and knowledge disclosed by Iwafuchi in order to provide an image

display unit capable of enhancing characteristics such as resolution, image quality, and luminous efficiency, facilitating formation of a large-sized screen, and reducing the production time and costs. And to provide a method of arraying devices, which is capable of transferring micro-devices to a wider region without degrading positional accuracy after transfer and without the occurrence of a wiring failure.

Iwafuchi must have an apparatus in order to control the chuck for transferring the pixel control devices. The manner in which the method claim is written does not "comprise using a mounting apparatus that comprises ...". Therefore the scope of the method is only limited to the positively recited method steps. The claim uses "wherein" language that does not limit the method steps because the language describing the apparatus structure is "for" doing steps but does not positively recite that the steps are actually performed.

As insofar as Claim 6 is definite, Iwafuchi further teaches wherein the pixel control devices are cut before the transferring step as such teaches wherein the substrate for pixel control devices is attached to the support substrate, with the surface of the substrate for pixel control devices provided with the plurality of integrated circuits directed downward toward the support substrate, in the step of fixing the substrate for pixel control devices onto the support substrate and, in the step of fixing the pixel control devices onto the substrate for pickup, the pixel control devices are transferred onto a surface of the substrate for pickup, with the substrate for pixel control devices upside down, after the substrate for pixel control devices is cut every one integrated

circuit, with the surface thereof directed downward toward the support substrate (Fig. 37-42).

Allowable Subject Matter

Claims 4, 5 and 8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Telephone / Fax Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Earl N. Taylor whose telephone number is (571) 272-8894. The examiner can normally be reached on Monday-Friday from 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on (571) 272-1657. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner: Earl N. Taylor

/DAVID VU/
Primary Examiner, Art Unit 2818